



Food and Agriculture
Organization of the
United Nations



International Plant Protection Convention
Protecting the world's plant resources from pests

PT 14: Irradiation treatment for *Ceratitis capitata*

Produced by the Secretariat of the
International Plant Protection Convention (IPPC)

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ISPM 28

Phytosanitary treatments for regulated pests

PT 14: Irradiation treatment for *Ceratitis capitata*

Adopted 2011; published 2016

Scope of the treatment

This treatment applies to the irradiation of fruits and vegetables at 100 Gy minimum absorbed dose to prevent the emergence of adults of *Ceratitis capitata* at the stated efficacy. This treatment should be applied in accordance with the requirements outlined in ISPM 18¹ (*Guidelines for the use of irradiation as a phytosanitary measure*).

Treatment description

Name of treatment	Irradiation treatment for <i>Ceratitis capitata</i>
Active ingredient	N/A
Treatment type	Irradiation
Target pest	<i>Ceratitis capitata</i> (Diptera: Tephritidae) (Mediterranean fruit fly)
Target regulated articles	All fruits and vegetables that are hosts of <i>Ceratitis capitata</i>

Treatment schedule

Minimum absorbed dose of 100 Gy to prevent the emergence of adults of *Ceratitis capitata*

Efficacy and confidence level of the treatment is ED_{99.9970} at the 95% confidence level.

Treatment should be applied in accordance with the requirements of ISPM 18.

This irradiation treatment should not be applied to fruits and vegetables stored in modified atmospheres.

Other relevant information

Since irradiation may not result in outright mortality, inspectors may encounter live but non-viable *Ceratitis capitata* (larvae and/or pupae) during the inspection process. This does not imply a failure of the treatment.

The Technical Panel on Phytosanitary Treatments based its evaluation of this treatment on the research work undertaken by Follett and Armstrong (2004) and Torres-Rivera and Hallman (2007), which determined the efficacy of irradiation as a treatment for this pest in *Carica papaya* and *Mangifera indica*.

Extrapolation of treatment efficacy to all fruits and vegetables was based on knowledge and experience that radiation dosimetry systems measure the actual radiation dose absorbed by the target pest independent of host commodity, and evidence from research studies on a variety of pests and commodities. These include studies on the following pests (with hosts in parentheses): *Anastrepha*

¹ The scope of phytosanitary treatments does not include issues related to pesticide registration or other domestic requirements for approval of treatments. Treatments also do not provide information on specific effects on human health or food safety, which should be addressed using domestic procedures prior to approval of a treatment. In addition, potential effects of treatments on product quality are considered for some host commodities before their international adoption. However, evaluation of any effects of a treatment on the quality of commodities may require additional consideration. There is no obligation for a contracting party to approve, register or adopt the treatments for use in its territory.

ludens (*Citrus paradisi* and *Mangifera indica*), *A. suspensa* (*Averrhoa carambola*, *Citrus paradisi* and *Mangifera indica*), *Bactrocera tryoni* (*Citrus sinensis*, *Lycopersicon lycopersicum*, *Malus domestica*, *Mangifera indica*, *Persea americana* and *Prunus avium*), *Cydia pomonella* (*Malus domestica*; also artificial diet) and *Grapholita molesta* (*Malus domestica*; also artificial diet) (Bustos *et al.*, 2004; Gould and von Windeguth, 1991; Hallman, 2004, Hallman and Martinez, 2001; Jessup *et al.*, 1992; Mansour, 2003; von Windeguth, 1986; von Windeguth and Ismail, 1987). It is recognized, however, that treatment efficacy has not been tested for all potential fruit and vegetable hosts of the target pest. If evidence becomes available to show that the extrapolation of the treatment to cover all hosts of this pest is incorrect, then the treatment will be reviewed.

References

The present standard refers to International Standards for Phytosanitary Measures (ISPMs). ISPMs are available on the International Phytosanitary Portal (IPP) at <https://www.ippc.int/core-activities/standards-setting/ispms>.

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- Torres-Rivera, Z. & Hallman, G.J.** 2007. Low-dose irradiation phytosanitary treatment against Mediterranean fruit fly (Diptera: Tephritidae). *Florida Entomologist*, 90: 343–346.
- von Windeguth, D.L.** 1986. Gamma irradiation as a quarantine treatment for Caribbean fruit fly infested mangoes. *Proceedings of the Florida State Horticultural Society*, 99: 131–134.
- von Windeguth, D.L. & Ismail, M.A.** 1987. Gamma irradiation as a quarantine treatment for Florida grapefruit infested with Caribbean fruit fly, *Anastrepha suspensa* (Loew). *Proceedings of the Florida State Horticultural Society*, 100: 5–7.

Publication history

This is not an official part of the standard

2007-12 TPPT developed draft text

2008-04 CPM-3 added topic *Irradiation treatment for Ceratitis capitata* (2007-204)

2008-11 SC revised draft text and approved for MC

2010-06 SC sent for MC under fast-track process

2010-12 SC recommended draft text to CPM via e-decision

2011-03 CPM-6 adopted Annex 14 to ISPM 28

ISPM 28. Annex 14 *Irradiation treatment for Ceratitis capitata* (2011). Rome, IPPC, FAO.

2014-10 Secretariat made minor formatting changes.

2015-07 IPPC Secretariat incorporated editorial amendments and reformatted standards following revoking of standards procedure from CPM-10 (2015).

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IPPC

The International Plant Protection Convention (IPPC) is an international plant health agreement that aims to protect cultivated and wild plants by preventing the introduction and spread of pests. International travel and trade are greater than ever before. As people and commodities move around the world, organisms that present risks to plants travel with them.

Organization

- ◆ There are over 180 contracting parties to the IPPC.
- ◆ Each contracting party has a national plant protection organization (NPPO) and an Official IPPC contact point.
- ◆ Nine regional plant protection organizations (RPPOs) work to facilitate the implementation of the IPPC in countries.
- ◆ IPPC liaises with relevant international organizations to help build regional and national capacities.
- ◆ The Secretariat is provided by the Food and Agriculture Organization of the United Nations (FAO).



International Plant Protection Convention (IPPC)

Viale delle Terme di Caracalla, 00153 Rome, Italy

Tel: +39 06 5705 4812 - Fax: +39 06 5705 4819

Email: ippc@fao.org - Web: www.ippc.int